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Chelodesmid studies. XVIII. A synopsis of the genus *Sandalodesmus* Silvestri, 1902, and proposal of the new tribe Sandalodesmini

(Polydesmida: Chelodesmidae)¹⁾

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Abstract

It is proposed, on the basis of indirect but compelling evidence, to revive the enigmatic and long-forgotten name *Sandalodesmus* Silvestri, 1902, as a senior synonym to *Gonioleptodesmus* Schubart, 1958. The latter genus has so far contained nine species confined to southern Brasil (Minas Gerais to Santa Catarina), all characterized by an unusual combination of gonopod modifications. These, added to the two species already placed in *Sandalodesmus*, make up a cohesive and distinct genus which is now increased by the description of the new species *Sandalodesmus librellus* (São Paulo, Brasil) and *S. avilectus* (Asunción, Paraguay). The new tribe Sandalodesmini is proposed to include *Sandalodesmus* and *Oncoleptodesmus* Schubart, 1958.

One of the most perplexing of Filippo SILVESTRI's enigmatic generic names is *Sandalodesmus*, proposed in 1902 for two species from the Paraná River basin, and diagnosed with the single brief sentence "Genus pororum positione et caracteribus maris in speciei sequentis descriptione notatis bene distinctum".

Although the verbal description of *Sandalodesmus Bertonii* which followed is fairly detailed, it contained no contrasting statements that might set the species (and genus) off from related taxa, and no drawings of the gonopods were given. Moreover, the original description of the other included species, originally described as *Odontopeltis Salvadorii* by SILVESTRI in 1895, is equally unrewarding. Under these circumstances it might be appreciated that other specialists would dismiss *Sandalodesmus* as a nomen inquirendum. This is exactly what happened.

Regardless of the shortcomings of its proposal, the name is nonetheless validly proposed and requires consideration; SILVESTRI was familiar with the chelodesmid fauna of the Paraná region and could be counted upon to recognize a distinctive taxon. Can the riddle be solved at present with any degree of confidence, given a better knowledge of that fauna than earlier workers could claim? Does the Latin diagnosis of *bertonii* afford any clues to the identity of the species it validates?

SILVESTRI claimed that the configuration of the ozopores and gonopods was characteristic and distinctive. For the first, he wrote "Pori fere omnino laterales et ab angulo postico

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carinarum parum remoti, a pulvino, usque ad angulum posticum carinarum pertinente, gesti". This condition does not occur in such regional genera as *Stachyproctus*, *Strongylomorpha*, and *Euthydesmus*, but is certainly evident in *Gonioleptodesmus* (Schubart, 1958) of which one species (*iguazuensis* Schubart) has been described from the territory harboring *bertonii*. Although this latter species was recorded from three localities along the upper Paraná River, I have so far been unable to locate any authentic material in the most likely depositories. There are no specimens in the museum at Genova; the species is not included in a typewritten list of SILVESTRI's types at Torino; nor does it figure in the published list of types at Portici (VIGGIANI, 1973). That it all should disappear seems most unlikely, and doubtless material will be discovered in some neglected museum cabinet. For the time being, however, recourse to typical material is not possible, and the same situation is regrettably true also for *Odontopeltis Salvadorii*.

Assuming *Gonioleptodesmus* to be a possible junior synonym of *Sandalodesmus*, can SILVESTRI's account of gonopod structure be reconciled with actual material referable to SCHUBART's genus? The published description for *S. bertonii* is as follows: "organum copulativum articulo ultimo hastis tribus constituto, quarum inferior, lata, laminaris apice rotundato, mediana canalifera, ceteris paululum longior apice falcato, supera brevior, crassior apice scamniiformi." Comparison shows that this is in fact a precise characterization of the "gonioleptodesmid" gonopod structure.

Lastly, although SILVESTRI did not illustrate his type material of *Odontopeltis salvadorii*, he did distribute specimens identified as this species to several colleagues, and there is a male in the U. S. National Museum, collected at Villa Rica, Paraguay, and labeled as being a paratype of "*Leptodesmus salvadorii*" in SILVESTRI's handwriting. This is obviously from the material reported in 1902 from that place, and although not a paratype in the modern sense of that term (actually it would be a metatype), there is no reason to doubt SILVESTRI's identification of at least the genus. This specimen belongs to a species which would be referred to *Gonioleptodesmus* in the present concept of that genus.

Although some doubt must remain concerning the specific identity of *bertonii*, I see no reason that *Sandalodesmus* cannot be recognized on the basis of the foregoing evidence, and propose here to retrieve the name from its long sojourn in oblivion.

The material upon which these observations are based came from several sources: Dr. Hubert Fechter kindly loaned some unidentified Neotropical millipeds which included one of the new species; the holotype is in the Bavarian State Zoological Collection (ZSM). Dr. Ralph Crabill loaned the specimen of *Odontopeltis salvadorii* from the United States National Museum (USNM). Dr. Harry G. Fowler gave me a number of interesting polydesmoids collected by him in Paraguay, including the type of a presumed new *Sandalodesmus*. I am very much indebted to these considerate colleagues.

Sandalodesmus Silvestri, 1902

Sandalodesmus Silvestri, 1902, Boll. Mus. Zool. Anat. comp. R. Univ. Torino, vol 17 (nr. 432), p. 4.

Gonioleptodesmus Schubart, 1958, Rev. Brasil. Biol., vol. 18, p. 29 (as subgenus of *Leptodesmus*). – Hoffman, 1967, Pap. Avuls. Zool. S. Paulo, vol. 21, p. 34 (elevated to generic status, summary of known species).

Diagnosis: Small to moderately large chelodesmids (25–45 mm in length), uniformly reddish in color; body widest near anterior end except in a few disjunct species; paranota relatively small, anterior corners obliquely rounded, ozopores located near posterior end of peritremata, visible in dorsal aspect on all segments. Anterior legs of males with apicoventral tibial soles and usually apical prefemoral knob. Gonopores opening on the truncate apex of cylindrical coxal gonapophyses. Sternum of segment 5 with or without paramedian processes.

Gonopod aperture variable, usually of above-average size, extending well into prozonum of segment 7, with lateral and posterior edges elevated. No median sternal element present, coxae in contact, each with acute apophysis on dorsolateral side and two macrosetae slightly lateral to its base. Cannula modified along its outer curvature into a projection varying from a low rounded knob to a large, acutely triangular lobe. Prefemur up to half total length of telopodite, with a laminate dorsal process slightly shorter than acropodite, latter set off on lateral side by prominent cingulum formed by strong flexure against prefemur. Prostatic groove following a more or less sinuous course along mesal face of acropodite; solenomerite broad, thin, and laminate, its distal half torsate about 180°, apically acuminate, partly or entirely contained inside a broad concavity formed by the acropodite.

Distribution: Paraguay and southern Brasil, from Minas Gerais as far south as Rio Grande do Sul; most of the known species occur in São Paulo and Paraguay (see map, Fig. 12).

Species: 13 species are presently included, two of them named as new in the following pages. Probably an equal number remain to be discovered.

Species Groups: An attempt was made in my 1967 paper on *Gonioleptodesmus* to organize the various forms of this genus into groups. There now being three additional species to incorporate, the occasion can be taken to review the validity of these groups as well as the homogeneity of the genus itself. Of course there can be little doubt that numerous species remain to be found, some of which may require substantial modification of any conclusions reached at the present.

On the basis of gonopod structure, I proposed six groups, four of them monospecific. One included *gasparae*, *hippocampus*, and *paranaensis*, all of which may be subspecifically related. A second contained the two disjunct northeastern forms *stramineus* and *schubarti* in Minas Gerais. The four remaining species *iguazuensis*, *araujoi*, *repandus*, and *camellatus* were each assigned to a separate group. The relationships of the species was reflected in an artificial key that took out the most disjunct forms first, with presumably related forms paired up in succeeding couplets.

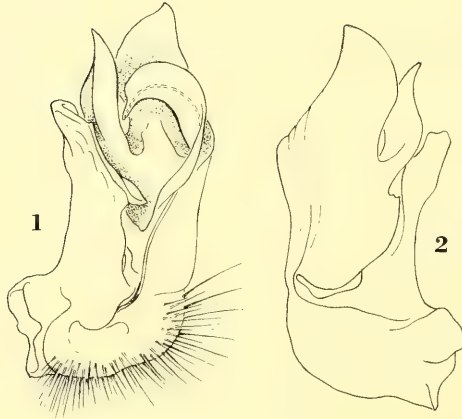
According to this key, *S. salvadorii* shares the first character stated with *araujoi*, and seems similar enough in overall features that these two may be combined into a single group. The two new species named in this paper appear to be closely related to each other, and in turn with *iguazuensis*; this association is reinforced for *avilectus* by its geographic proximity to that species.

Looking at all of the known species collectively, we find essential homogeneity in gonopod structure except for the two members of the *Stramineus* Group, in which the telopodite has nearly the proportions of most chelodesmoids: acropodite much longer than prefemur, the prefemoral process not torsate, and the tibiotarsal region not a concave shield containing most or all of the solenomerite. These two species are, moreover, ap-

preciably smaller than the majority of other species, and the modification of the cannula is scarcely noticeable. They may perhaps be regarded as representing a generalized condition for the genus, transitional from more typical chelodesmoids. For the purposes of comparison, I reproduce here two gonopod drawings made from *S. schubarti*. It is not impossible that future knowledge may dictate removal of these two species into a separate genus.

To update current information about this genus, I provide once again references to the species that I know only from literature, as well as those discussed here on the basis of actual material.

Salvadorii Group



Figures 1, 2: *Sandalodesmus salvadorii* (Silvestri), left gonopod of specimen identified as this species by F. Silvestri. 1: telopodite, mesal aspect. 2: telopodite, lateral aspect. The deep emargination of the calyx is evident.

Sandalodesmus salvadorii (Silvestri) (Figs. 1, 2)

Odontopeltis Salvadorii Silvestri, 1895, Boll. Mus. Torino, vol. 10, no. 203, p. 4, fig. 3. Type material (present location unknown), from the Rio Apa, Paraguay (A. Borelli).

Leiodesmus Salvadorii: Silvestri, 1897, Boll. Mus. Torino, vol. 12, no. 283, p. 5.

Sandalodesmus Salvadorii: Silvestri, 1902, Boll. Mus. Torino, vol. 17, no. 432, p. 5. Material listed from Villa Rica, Paraguay.

Catharodesmus salvadorii: Attems, 1938, Tierreich, lief. 69, p. 60.

The problems afflicting identification of this species, in the present lack of type material, have been discussed in an introductory paragraph. The specimen labeled by SILVESTRI as a paratype and sent to the U. S. National Museum, is in fact from a locality some 300 km south of the Rio Apa and was collected some years after the real type series. For this reason, some of my colleagues might deplore my use of the specimen as a basis for the

specific concept. While there is of course always a possibility for error, I think that if my drawing of the gonopod in lateral aspect (Fig. 2) is compared with SILVESTRI's original Fig. 3, a striking similarity must be admitted, when allowance has been made for a slightly different aspect and the likelihood that SILVESTRI's drawing was probably made "freehand". I am personally convinced that the Villa Rica specimen at hand is conspecific with the type of *salvadorii*.

Sandalodesmus araujo (Schubart), comb. nov.

Leptodesmus araujo Schubart, 1946, An. Acad. Cienc. Brasil., vol. 18, p. 171, fig. 4. Holotype male (MZUSP) from Rodrigues Alves (48.34 W, 23.20 N), Mun. São Manuel, São Paulo.

Leptodesmus (*Gonioleptodesmus*) *araujo*: Schubart, 1958, An. Acad. Cienc. Brasil., vol. 18, p. 29.

Gonioleptodesmus araujo: Hoffman, 1967, Pap. Avuls. São Paulo, vol. 21, p. 34.

The structure which in 1967 I referred to as a subtriangular femoral process on the lateral side of the gonopod appears to be similar to a corresponding process in *salvadorii*, apparently in both the result of a deep emargination of the calyx lobe. Until the type material of *araujo* can be restudied, no harm results from associating these two species in the same group.

Iguazuensis Group

Sandalodesmus iguazuensis (Schubart), comb. nov.

Leptodesmus iguazuensis Schubart, 1954, Notas Mus. Eva Peron (= Mus. La Plata), vol. 17, p. 138, fig. 14. Type material (Mus. La Plata) from Puerto Iguazú, Prov. Misiones, Argentina.

Gonioleptodesmus iguazuensis: Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 35.

This species has been carefully described and illustrated by SCHUBART. On the basis of its geographical location, one might justly suspect synonymy with *S. bertonii*, and the two appear to be of the same size and general form. SILVESTRI's description, however, attributes tibial soles only to the first 11 pairs of legs, whereas such structures are absent only from the last two pairs in *iguazuensis*. The sternum of the 6th segment is said to have two thick cuneiform processes in *bertonii*, only a pair of low knobs in *iguazuensis*. Such differences are certain to be substantiated by departures also in gonopod structure.

There seems to be little doubt that *iguazuensis* is fairly closely related to the following two species, both of which appear to be undescribed.

Sandalodesmus librellus, sp. n. (Figs. 3, 4, 9)

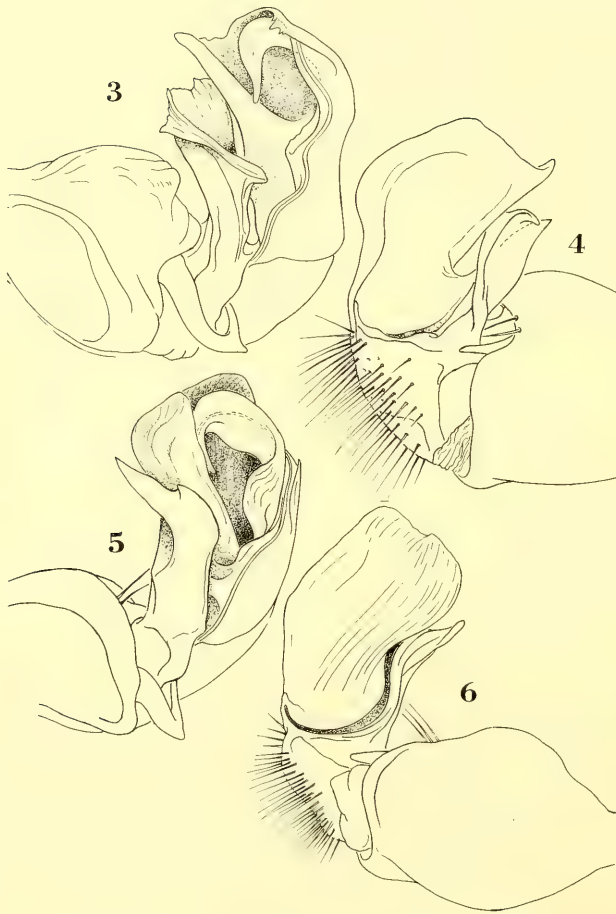
Material: Adult male (ZSM), taken „unter Blumentöpfen“ in garden, São Paulo (city), Brazil; W. Bücherl leg., without date.

Diagnosis: A large member of the genus (length to 45 mm in males) with prefemoral knobs on legs 2–7 and tibial soles on legs 1–10, pleurosternal carinae prominent back to segment 8, sternum of 6th segment with distinct transverse ridge between anterior legs, and a distinctive gonopod structure as shown in Figs. 3 and 4.

Holotype: Adult male, length about 44.5 mm, widths of alternating segments as follows (across paranota):

segment 1-6.8 mm
 2-7.6 mm
 4-damaged
 6-7.5 mm
 8-7.4 mm

segment 10-7.3 mm
 12-7.3 mm
 14-6.8 mm
 16-6.2 mm
 18-5.0 mm



Figures 3-6: Left gonopods of two species of *Sandalodesmus*, drawn from holotypes. 3: *S. librellus*, n. sp., mesal aspect, all setae omitted. 4: the same gonopod, lateral aspect, setation indicated. 5: *S. avilectus*, n. sp., mesal aspect, only coxal setae shown. 6: the same gonopod, lateral aspect.

Width/length ratio at segment 6, 16.6%; depth of segment 12, 5.8 mm, depth/width ratio, 80%.

Coloration uniformly dark reddish-brown; antennae about the same color, legs slightly paler.

Head entirely smooth and polished, width across genal apices 4.3 mm, genae without evident median depression. Labrum depressed, colorless, but not otherwise set off from

clypeus. Facial setae: epicranial 2-2, supraantennal 1-1, interantennal 1-1, subantennal 1-1, genal 5-5, frontal 3-3, clypeal about 7-7, labral about 16-16. Epicranial suture prominent, punctate, bifurcate between antennae.

Antennae moderate in length (7.6 mm) and slender, extending caudad to posterior edge of 4th segment, about equal in length to greatest body width. Antennal articles slender, slightly clavate distally, nearly glabrous except the distalmost three, articles 2-5 similar in size and appearance. 7th article semiglobose, with rounded sensory organ on outer side; distal edge inturned and separating sensory cones into two unequal diads. Sensory areas present on outer ends of articles 5 and 6.

Collum wider than head, lateral ends depressed, surface smooth and polished. Anterior edge set off by a fine lateral rim, posterior edge continuous with surface.

Paranota set high on body, nearly horizontal, less than $\frac{1}{4}$ th diameter of metazona, those of segments 2-4 overlapping, the others separated; paranota of anterior body segments laterally depressed, \pm continuing slope of dorsum, the posterior corners nearly rectangular; those of midbody segments with anterior corner suppressed, lateral edge curving evenly caudolaterally from the stricture; paranota of segments 17-19 abruptly smaller, those of 19th merely small lobes large enough to contain the pores, and set much lower on sides than those of 18th.

Scapulae poorly developed and submarginal on all segments, anterior surface of paranota visible in dorsal aspect; peritremata small, ovoid, occupying caudal half of paranotal edge; pores opening dorsolaterally, located in posterior fourth of each peritreme. Limbus narrow and unmodified. Stricture without distinct anterior rim and not costulate. Surface of segments with numerous minute punctations, otherwise complete.

Epiproct short, subtriangular, with the usual two distal whorls of setae. Paraprocts nearly flat, smooth, unmodified, the margins compressed but not dorsally enlarged. Hypoproct broad, subtriangular, unmodified, with a median projection and two smaller paramedian setiferous tubercles at its base.

Podosterna moderately developed, completely glabrous and produced into four indistinct subcoxal tubercles, those of posterior pair much the larger. Sternum of 2nd pair of legs moveably attached to pleurotergum of 3rd segment as usual in the family, coxae with prominent, slightly compressed, distally truncate gonapophyses. Sternum of segment 5 relatively broad, with deep transverse groove and a much shallower longitudinal median groove, produced into two prominent, massive, rounded, contiguous lobes between anterior pair of legs. Sternum of segment 6 broad, depressed between coxae of posterior pair of legs, produced into high, transverse ridge between anterior legs.

Legs moderately long and slender, setal vestiture most profuse on dorsal and ventral sides of podomeres, and becoming longer and more prominent on the distalmost segments. Prefemoral knobs prominent as far back as 7th pair of legs. Anterior legs with prominent tibial soles subtending the tarsi on legs 1 through 10. Tarsal claws nearly straight. Relative lengths of podomeres at midbody: $3 > 6 > 5 = 2 > 4 = 1$.

Sides of metazona with prominent, sharp-edged pleurosternal carinae back to segment 8, represented by fine oblique line to segment 13. Stigmata in the form of elongate vertical slits, distinctly raised above level of segment, anterior about 50% larger than posterior, latter distinctly separated from posterior dorsal coxal condyle.

Gonopod aperture unusually large, extending laterad beyond ends of coxal sockets and reducing prozonum to narrow strip in front, stricture thus displaced anteriorly and redu-

ced to thin narrow groove. Posterior edge strongly elevated in front of 8th pair of legs, but rim deeply emarginate medially.

Gonopods (Figs. 3-4) relatively large despite the abbreviated telopodite which is only subequal in size to the coxa. Coxal apophysis small, displaced dorsolaterad, the two macrosetae proximad to its base. Telopodite set against coxa at right angle, prefemur large, densely setose, process shorter than end of telopodite, its anterior subdistal edge bent obliquely dorsoventrad. Acropodite notably abbreviated, only slightly longer than prefemur, the two elements separated on lateral side by prominent cingulum; form of its distal end and of solenomerite as shown in Figure 3.

Remarks: This very characteristic sandalodesmid seems clearly referable to the *Iguazuensis* Group, but if this assumption is correct, São Paulo is somewhat out of the expected range. Possibly the only known specimen was imported among plant material from much farther west, a possibility enhanced by the fact that it was collected in a garden.

The name is a Latinization of the family name of the collector.

Sandalodesmus avilectus, sp. nov. (Figs. 5-7)

Material: Male holotype (ZSM) from San Lorenzo, near Asunción, Paraguay; Harry G. Fowler leg. 27 February 1975.

Diagnosis: A species of the *Iguazuensis* Group as indicated by the prefemoral region of the gonopod, broadly laminate tibiotarsal calyx, and nontorsate prefemoral process; differing from both *iguazuensis* and *librellus* in shape of the gonapophyses of the 2nd coxae, and in the presence of prefemoral knobs and tibial soles on all legs except the last two pairs.

Holotype: Adult male, length about 42 mm (specimen fragmented); body widest at segment 2, nearly parallel-sided over segments 8-14, thence abruptly attenuated to epi-proct, as usual in this genus:

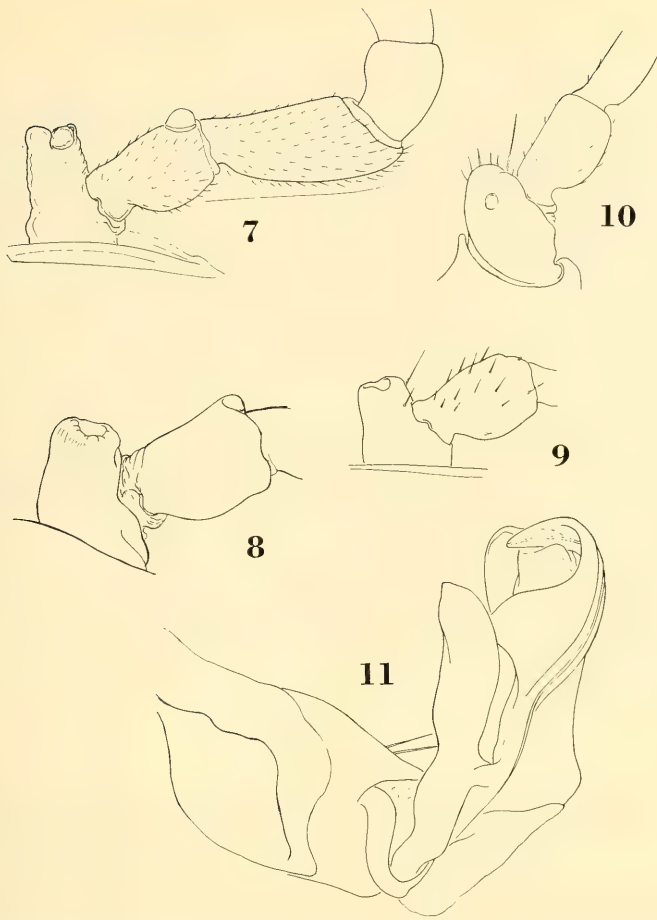
segment	1-5.6 mm	segment	10-5.2 mm
	2-5.8 mm		12-5.2 mm
	4-5.7 mm		14-5.0 mm
	6-5.2 mm		16-4.8 mm
	8-5.0 mm		18-3.5 mm

Coloration uniformly reddish-brown except legs and antennae slightly lighter, with some yellowish shade.

Except for the cited measurements, the specimen agrees very closely with the detailed description of *S. librellus* in most aspects of structure. The shape of the gonapophyses of the 2nd coxae is characteristic, the actual opening being located distinctly acentrically (Fig. 7). Prefemoral knobs and tibial soles occur on all legs except the last two pairs.

Gonopods (Figs. 5, 6) similar to those of *S. iguazuensis*, but solenomerite much more massive and apically reflexed, and with prominent basal lobe; tibiotarsal calyx scarcely longer than outer curvature of solenomerite. Cingulum on lateral side very prominent, at end of prefemur.

Remarks: On the basis of geographical origin, this species might be taken to be the same as SILVESTRI's *S. bertonii*, but according to the description of the latter, tibial soles occur only on the anterior half of the body instead of on virtually all of the legs as in *avilectus*.



Figures 7–11: Structural features, four species of *Sandalodesmus*. 7: *S. avilectus*, n. sp., part of 2nd leg of male, aboral aspect. 8: *S. librellus*, n. sp., coxa and prefemur of 2nd leg of male, aboral aspect. 9: *S. salvadorii* (Silvestri), coxa and prefemur of 2nd pair of legs of male, aboral aspect. 10: *S. schubarti* (Hoffman), coxa and prefemur of 2nd pair of legs, aboral aspect. 11: *S. schubarti*, left gonopod of holotype, mesal aspect.

The species' name, meaning "bird catcher" is a Latinization of the family name of the collector of the type specimen.

Camellatus Group

Sandalodesmus camellatus (Schubart), comb. nov.

Leptodesmus camellatus Schubart, 1954, Arq. Mus. Paranaense, vol. 10, p. 102, figs. 15, 16. Type material (Mus. Paranaense) from Taio, Mun. Rio do Sul, Santa Catarina, Brasil.

Gonioleptodesmus camellatus: Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 35.

Gasparae Group

No changes in the status or composition of this group have occurred since my synopsis in 1967. The three included species are distinguished by fairly trivial characters, and may well be shown to be only forms of one polytypic species.

Sandalodesmus gasparae (Schubart), comb. nov.

Leptodesmus gasparae Schubart, 1944, Acta Zool. Lilloana, vol. 2, p. 351, figs. 20–23. Type material (Mus. São Paulo) from Estação Experimental de Caca e Pesca, Mun. Pirassununga, São Paulo, Brasil.

Gonioleptodesmus gasparae: Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 35.

Sandalodesmus hippocampus (Schubart), comb. nov.

Leptodesmus hippocampus Schubart, 1944, Acta Zool. Lilloana, vol. 2, p. 355, figs. 24–26. Type material (Mus. São Paulo) from Usina Corumbataí, Mun. Rio Claro, São Paulo, Brasil.

Gonioleptodesmus hippocampus: Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 35.

Sandalodesmus paranaensis (Schubart), comb. nov.

Leptodesmus paranaensis Schubart, 1954, Arq. Mus. Paranaense, vol. 10, p. 100, fig. 14. Type material (Mus. Paranaense) from Caviuna, Mun. Rolandia, São Paulo.

Gonioleptodesmus paranaensis: Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 35.

Stramineus Group

Aside from their shared gonopod structure, the two species of this group are the smallest members of the genus, and occupy a peripheral location in the generic area. Two features – the scarcely modified cannula and the large unenclosed solenomerite – are noteworthy and suggest a generalized or primitive condition. In *S. schubarti*, at least, the male gonopore (Fig. 10) does not open on a truncate coxal lobe, but in the posterior subterminal position typical of most chelodesmoids, and both species lack prefemoral knobs in the male sex. All of these considerations suggest this group probably merits separate generic status.

Sandalodesmus stramineus (Schubart), comb. nov.

Leptodesmus stramineus Schubart, 1956, Rev. Brasil. Biol., vol. 16, p. 359, fig. 3. Type material (Mus. São Paulo) from Lapa Vermelha [19.38 S, 44.53 W], Mun. Lagoa Santa, Minas Gerais, Brasil.

Leptodesmus (Gonioleptodesmus) stramineus: Schubart, 1958, Rev. Brasil. Biol., vol. 18, p. 29.

Gonioleptodesmus stramineus: Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 40.

Sandalodesmus schubarti (Hoffman), comb. nov. (Figs. 10, 11).

Gonioleptodesmus schubarti Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 35, figs. 1–4. Type material (Mus. São Paulo) from Sete Lagoas, [19.27 S, 44.14 W], Minas Gerais, Brasil.

Drawings of the 2nd male coxa and gonopod are introduced here to show their dissimilarities from the corresponding structures in more “typical” members of the genus.

Repandus Group

Sandalodesmus repandus (Schubart), comb. nov.

Leptodesmus (*Gonioleptodesmus*) *repandus* Schubart, 1958, Rev. Brasil. Biol., vol. 18, p. 29, fig. 4.

Type material (Mus. São Paulo) from Ponta Grossa, Mun. Porto Alegre, Rio Grande do Sul, Brasil.

Gonioleptodesmus repandus: Hoffman, 1967, Pap. Avuls. Zool. São Paulo, vol. 21, p. 35.

Group uncertain

Sandalodesmus bertonii Silvestri

Sandalodesmus bertonii Silvestri, 1902, Boll. Mus. Torino, vol. 17 (no. 432), p. 4. Location of type material unknown, see discussion in introductory section; specimens cited from Puerto Bertoni (Edo. Parana, Paraguay), Bella Vista (Edo. Parana, Brasil), and Santa Ana (Prov. Misiones, Argentina). Possibly several species are represented in this material.

Although SILVESTRI's description contains little of a specific nature, it does appear to rule out the possibility that either *iguazuensis* or *avilectus* might be junior synonyms of *bertonii* (as discussed under each of those species). Some of the original material will eventually be discovered and this problem solved.

Tribal position

The curious gonopod structure, in connection with the modified gonapophyses of the male, suggests appreciable departure from the normal construction of Brazilian chelodesmids, and invites consideration of their taxonomic significance.

Although great progress has been made during the past decade in sorting the Neotropical genera of the family into tentative tribal groups, the great nuclear fauna of south-eastern Brasil has so far been largely immune to analysis. The majority of species there remain under the old name *Leptodesmus*, and must be sorted out into a number of new genera before additional tribes can be readily defined. The status of *Sandalodesmus* may be examined, however, since this name is one of the oldest in the Brazilian fauna, and a tribe based upon it is unlikely to be threatened by future discoveries. At the present, there seems little close relationship of *Sandalodesmus* with the established tribes Leptodesmini, Chelodesmini, Strongyломorphini, and Platinodesmini, which are represented in the same part of South America.

There appears to be a close relationship with *Oncoleptodesmus* (Schubart, 1958), in which the gonopods are similar to the sandalodesmid-type in their strongly abbreviated acropodite, incurved and concealed solenomerite, and uncate cannula. All of these features are even more extreme than in *Sandalodesmus*, and suggest that *Oncoleptodesmus* is a specialized southern derivative of it. Certainly these two taxa merit recognition in a tribal context.

Almost certainly, however, other components will be added. Judged only from published information, I suspect that *Leptodesmus miranda-ribeiroi* Schubart must be designated type of a related genus, through which a transition into more typical chelodesmids

may be traced. A tribe based upon *Sandalodesmus* will thus contain a nominate genus which is by no means anatomically typical of the majority of the taxon. This, of course, is certainly not a rare situation in any group of organisms, and I herewith propose to set up the basis of a tribe which will be enlarged and altered in concept as referable species become known.

Sandalodesmini, trib. nov.

Components: *Sandalodesmus* Silvestri, 1902; *Oncoleptodesmus* Schubart, 1958.

Diagnosis: Small to moderately large chelodesmids, the body relatively slender, broadest at segment 2 or 3; terga moderately convex, smooth and polished; paranota of moderate size, with ozopores in normal sequence and placed near posterior end of peritreme; general form of epi-, para-, and hypoproct unmodified, typical for the family.

Gonopods notably reduced in size, entire telopodite subequal to or smaller than coxa, latter massive, with two apical setae on lateral side and small apophysis, no tendency for lateral elongation. Cannula ranging in appearance from nearly normal to highly modified with a prominent acute projection at midlength. Prefemoral process relatively large, subspatulate and partially enclosing acropodite, latter set off from prefemur on lateral side by

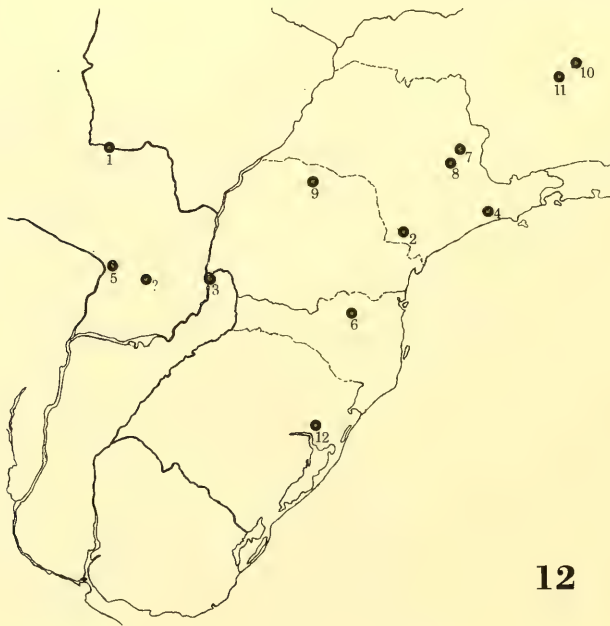


Figure 12: Distribution of the 12 known species of *Sandalodesmus*, indicated by the relevant numbers. (*S. bertonii* could not be included): 1, *S. salvadorii*; 2, *S. araujoii*; 3, *S. iguazuensis*; 4, *S. librellus*; 5, *S. avilectus*; 6, *S. camellatus*; 7, *S. gasparae*; 8, *S. hippocampus*; 9, *S. paranaensis*; 10, *S. stramineus*; 11, *S. schubarti*; 12, *S. repandus*.

a prominent reflexure-suture, distally more or less broadened and often forming a calyx that shields or actually envelops the solenomerite. Solenomerite broad, laminate, strongly curved (torsate) dorsad, often reflexed proximad. Prostatic groove visible for most of its length in mesal aspect.

Distribution: Species of *Sandalodesmus* occur from Paraguay eastward to the southern part of Minas Gerais and south into Rio Grande do Sul, Brasil; those of *Oncoleptodesmus* are confined to the last-mentioned state.

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